WHAT IS CLAIMED IS:

1. A method for detecting one or more component of interest in a fluid-borne sample in a microchannel of a microfluidic device, the method comprising the steps of:

(i) flowing the fluid-borne sample which comprises the one or more component of interest through a binding channel region of the microchannel, which binding channel region comprises a component-binding moiety which is reversibly bound to a wall surface of the binding channel region, thereby binding at least a portion of the one or more component of interest to the component-binding moiety to form a bound complex;

(iii) releasing the complex comprising the component-binding moiety and the one or more component of interest from the binding channel region thereby releasing the complex into the microchannel; and,

(iv) flowing the released complex through a separation channel region of the microchannel and detecting the complex.

2. The method of claim 1, wherein the one or more component of interest comprises a protein and the component-binding moiety comprises a protein-binding moiety.

3. The method of claim 2, wherein the protein comprises alpha-fetoprotein.

4. The method of claim 3, wherein the component-binding moiety comprises an antibody specific to the alpha-fetoprotein.

5. The method of claim 4, wherein the antibody comprises a nucleic acid chain bound thereto which includes at least one fluorescent label associated therewith.

6. The method of claim 5, wherein the nucleic acid chain bound to the antibody comprises two or more fluorescent labels.

7. The method of claim 1, wherein the wall surface of the binding channel region of the microchannel is at least partially coated with biotin derivatized silane to which streptavidin is bound, wherein the streptavidin is used to bind a biotinylated nickel chelator that binds nickel to the wall surface of the binding channel region of the microchannel.

8. The method of claim 7, wherein the component binding moiety is coupled to a polyhistidine tail to mediate binding to the nickel coated wall surface of the binding channel region of the microchannel.

9. The method of claim 8, wherein the step of releasing the bound complex from the binding channel region comprises flowing an elution buffer through the microchannel.

10. The method of claim 9, wherein the elution buffer comprises imidazole buffer.

11. The method of claim 1, wherein the component-binding moiety or the component of interest comprises a label moiety.

12. The method of claim 1, wherein the binding channel region comprises a derivatized channel.

13. The method of claim 1, wherein the binding channel region comprises one or more particle set, the particle set comprising a plurality of particle member types.

14. The method of claim 1, wherein flowing the fluid-borne sample through the binding channel region comprises applying pressure to the fluid in the microchannel.

15. The method of claim 1, wherein flowing the fluid-borne sample through the binding channel region comprises electrokinetically flowing the fluid therein.

16. The method of claim 1, wherein releasing the complex from the binding channel region comprises adjusting the temperature or pH in the binding channel region or introducing one or more releasing reagents into the binding channel region.

17. The method of claim 1, wherein detecting the released complex comprises optically detecting a luminescent, color, electrogenic, or fluorescent label moiety fixed to one or more of the component of interest or the component binding moiety.

18. The method of claim 1, wherein the component binding moiety is reversibly bound to a wall surface of the binding channel region by ionic interaction therewith.

19. The method of claim 1, the method further comprising labeling the component binding moiety with a fluorescent label and detecting the released complex by detecting the fluorescent label.

20. The method of claim 1, wherein the one or more component of interest comprises a protein and the first and second component-binding moieties comprise a protein-binding moiety.

21. A method for detecting one or more component of interest in a fluid-borne sample in a microchannel of a microfluidic device, the method comprising the steps of:

(i) flowing the fluid-borne sample which comprises the one or more component of interest bound to a first labeled component binding moiety to form a first labeled complex through a binding channel region of the microchannel, which binding channel region comprises at least a second component-binding moiety which is reversibly bound to a wall surface of the binding channel region, thereby binding at least a portion of the one or more component of interest to the second component-binding moiety to form a second labeled complex;

(iii) releasing the second labeled complex comprising the first and second component binding moieties and the one or more component of interest from the binding channel region thereby releasing the second complex into the microchannel; and,

(iv) flowing the released second complex through a detection channel region of the microchannel and detecting the second labeled complex.

22. The method of claim 21, wherein the protein comprises alpha-fetoprotein.

23. The method of claim 22, wherein the first and second component-binding moieties comprise antibodies specific to the alpha-fetoprotein.

24. The method of claim 23, wherein one of the antibodies comprises a nucleic acid chain bound thereto which includes at least one fluorescent label associated therewith.

25. The method of claim 24, wherein the nucleic acid chain bound to the antibody comprises two or more fluorescent labels.

26. The method of claim 21, wherein the wall surface of the binding channel region of the microchannel is at least partially coated with biotin derivatized silane to which streptavidin is

bound, wherein the streptavidin is used to bind a biotinylated nickel chelator that binds nickel to the wall surface of the binding channel region of the microchannel.

27. The method of claim 26, wherein the first component binding moiety is coupled to a polyhistidine tail to mediate binding to the nickel coated wall surface of the binding channel region of the microchannel.

28. The method of claim 27, wherein the step of releasing the second complex from the binding channel region comprises flowing an elution buffer through the microchannel.

29. The method of claim 28, wherein the elution buffer comprises imidazole buffer.

30. The method of claim 21, wherein the first component-binding moiety comprises at least one detectable label moiety.

31. The method of claim 30, wherein the first component binding moiety further comprises a charge modifying moiety.

32. The method of claim 31, wherein the charge modifying moiety comprises a nucleic acid chain.

33. The method of claim 32, wherein the nucleic acid chain is bound to the at least one label moiety.

34. The method of claim 21, wherein the binding channel region comprises a derivatized channel.

35. The method of claim 21, wherein the binding channel region comprises one or more particle set, the particle set comprising a plurality of particle member types.

36. The method of claim 21, wherein flowing the fluid-borne sample through the binding channel region comprises applying pressure to the fluid in the microchannel.

37. The method of claim 21, wherein flowing the fluid-borne sample through the binding channel region comprises electrokinetically flowing the fluid therein.

38. The method of claim 21, wherein releasing the second complex from the binding channel region comprises adjusting the temperature or pH in the binding channel region or introducing one or more releasing reagents into the binding channel region.

39. The method of claim 21, wherein detecting the released second complex comprises optically detecting a fluorescent label moiety fixed to one or more of the component of interest or the first component binding moiety.

40. The method of claim 21, further comprising labeling the first component binding moiety with a fluorescent label and detecting the released second complex by detecting the fluorescent label.

41. The method of claim 21, wherein the second component binding moiety is unlabeled.